CS 346 – Computational Modeling & Simulation I (Interdisciplinary Science)

Professor Eric Aaron

Lecture – T R 11:00am

Lecture Meeting Location: It’s complicated…
Lab Meeting Location: It’s complicated…

Instructor Info

- Professor Eric Aaron

  Website: https://cs.colby.edu/eaaron
  Office: Davis 113
  Office Hours: M 2:30-4pm, T 4-5pm, W 2:30-4pm and 6:30-7:30pm, and by email appointment
  Phone/Voicemail: (207) 859-5857
  E-mail: eaaron@colby.edu

  The above email address is the best way to contact me

  Course Website: https://cs.colby.edu/courses/S21/cs346
Title IX Statement, pt. I

Colby College prohibits and will not tolerate sexual misconduct or gender-based discrimination of any kind. Colby is legally obligated to investigate sexual misconduct (including, but not limited to, sexual assault and sexual harassment) and other specific forms of behavior that violate federal and state laws (Title IX and Title VII, and the Maine Human Rights Act). Such behavior also requires the College to fulfill certain obligations under two other federal laws, the Violence Against Women Act (VAWA) and the Jeanne Clery Disclosure of Campus Security Policy and Campus Statistics Act (Clery Act).

To learn more about what constitutes sexual misconduct or to report an incident, see: www.colby.edu/studentlife/handbook-section/f-sexualmisconduct/

Title IX Statement, pt. II

If you wish to speak confidentially about an incident of sexual misconduct, you may contact:

- Counseling Center: 207-859-4490
- Gender and Sexual Diversity Program: Director Emily Schusterbauer (eeschust@colby.edu/ 207-859-4093)
- Office of Religious & Spiritual Life: 207-859-4272
  - Dean of Religious & Spiritual Life, Kurt Nelson (kdnelson@colby.edu)
  - Jewish Chaplain, Erica Asch (elsasch@colby.edu)
  - Catholic Campus Minister, Charles Demm (cademm@colby.edu)

**Students should be aware that faculty members are considered "responsible employees"**; as such, if you disclose an incident of sexual misconduct to a faculty member, they have an obligation to report it to Colby's Title IX Coordinator. "Disclosure" may include communication in-person, via email/phone/text, or through class assignments.

I take Title IX seriously. Please feel free to talk with me for more information!
A tiny bit about the course

• Your textbook:
  – Also, likely some additional readings TBD

• Programming language: Matlab
  – Available on all lab machines
  – Available on your laptop computer

• In addition to graded assignments, some work will be assigned as *optional*, not to be graded
  – Students who want the extra learning experience can get it, without imposing extra work on, e.g., remote students

Did you know: CS346 is the only CS upper-level elective available to remote students this semester?

A tiny bit more about the course:
Components of graded work in CS378

• Projects
  – Will have some programming component
    • May also include problem sets
  – Some expected to be multi-stage assignments, which makes deadline on first stage especially important

• Small assignments
  – Given occasionally; graded on ✓+/✓/✓-/0 basis
  – May be discussed in next class meeting

• Final Project / Exercise (no Final Exam)

• Class participation
  – Anything that constructively contributes to class discussion: speaking in class, making points in office hours, making points by email, etc.
A bit more about the course

• “Real” Course Title:
  – *Computational Modeling, Simulation, and Analysis for Interdisciplinary Science*

To some readers, words in this title may suggest that the course will be a statistical methods course. **CS346 will not be such a course!**

Course description:

– A programming-oriented introduction to techniques in computational modeling and simulation, motivated by applications to the natural and social sciences. Topics may include: dynamical system simulation; finite difference equations; numerical error in simulation; numerical methods for integration; Monte Carlo simulation; cellular automata; and agent-based modeling. Students complete projects in multiple application domains to develop interdisciplinary breadth; to understand explanatory models and methods underlying computational science; and to develop programming style and skills that support easily extended and maintained code.

To some readers, words in this description may suggest that the course may be a software engineering course. **CS346 will not be such a course!**
Some (Perhaps Non-Obvious) Notes and Goals for *Computational Modeling, Simulation, and Analysis for Interdisciplinary Science*

- Interdisciplinary enterprises have their own challenges
- **Intended audience of this course:**
  - Programming-literate thinkers who want to be more productive participants in interdisciplinary computational science
- For interdisciplinary (computational) science:
  - “Soft skills” matter: Communication (including data visualization) is important, especially across interdisciplinary language gaps
  - Methods from experimental science (e.g., experimental design) matter
  - “Getting it right” matters: Replicable, well documented experiments and well tested code are essential to computational science
    - For programmers: *specification* and *validation* of code matter

**Assignment 0**

- Email me from the account at which you’d want me to contact you
  - Include a sentence on what you’d like to get out of the course
  - … plus a sentence or two on your previous experience with interdisciplinary computational sciences (if any—none is required for the class!)
  - … plus anything else you might like to tell me!

- Also, please tell me whether or not you’re on campus this semester, and if not, what your time zone is

- Also, in your email, let me know if you were able to access the course website and lecture notes without any difficulties
  - Remember: website is at [https://cs.colby.edu/courses/S21/cs346](https://cs.colby.edu/courses/S21/cs346)

(I’ll post lecture notes by the end of the day—i.e., midnight—today)
Business

• Instructions for downloading Matlab (for free!) are available from the *Useful Links and Additional Notes* link on the CS346 website
  - We’ll start with Matlab soon, so please do this soon!
  - (There are some restrictions on usage, but they won’t affect you in CS346. As always, feel free to see me with questions!)

• To do an online search of Mathworks.com resources, try typing this into your searchbar:
  
  `site:mathworks.com <yourSearchTerms>`